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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/664,318

09/16/2003

William Facinelli

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7590

05/06/2005

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EXAMINER

BASINGER, SHERMAN D

ART UNIT

PAPER NUMBER

3617

DATE MAILED: 05/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/664,318

Applicant(s)

FACINELLI ET AL.

Examiner

Sherman D. Basinger

Art Unit

3617

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 04 April 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7-21, 24 and 25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-21, 24 and 25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 December 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-5 and 7-21, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Broinowski in view of Aschauer, Roos and Henmi et al.

In Broinowski the rotor with five blades is 33, the stator with 8 blades is 35, the first housing section is 14, the second housing section is 16, and as is shown in figure 1, the stator hub extends downstream of the downstream end of the second housing section. The housing section 16 is considered, due to its taper, to define a combined stator housing and nozzle. Note that the second housing tapers from an upstream end having a first diameter to a downstream end having a second diameter that is smaller than the first diameter.

*Broinowski does not discuss that each rotor blade is shaped so as to have uneven loading from the hub to the tip; that each rotor blade has a tip wherein each rotor blade is shaped so as to have nonuniform loading as measured from the hub to the tip of each rotor blade; and that each rotor blade further having a tip and being shaped so that the loading on each rotor blade at the tip is greater than the loading on the rotor blade at*

*the hub. In Broinowski the loading at the leading edge of each blade of the impeller shown in figure 12 is different than the loading at the trailing edge of each blade. In otherwords the loading on each blade of the impeller shown in figure 12 changes from the inlet end of the impeller to the outlet end of the propeller. This is in keeping with how impellers work. Thus, the loading at the hub of the blade at the inlet of the impeller is different than the loading at the tip of the blade at the outlet of the impeller, and the loading changes (is nonuniform or uneven) continuously along the blade from the inlet to the outlet of the impeller.*

*Because at the inlet of the impeller the loading of each blade at the hub is not uniform or not even with the loading of the blade tip at the blade outlet, in Broinowski each rotor blade is shaped so as to have uneven loading from the hub (at the inlet of the propeller) to the tip (at the outlet of the propeller); that each rotor blade has a tip wherein each rotor blade is shaped so as to have nonuniform loading as measured from the hub (at the impeller inlet) to the tip (at the outlet of the propeller) of each rotor blade; and that each rotor blade further having a tip and being shaped so that the loading on each rotor blade at the tip (at the inlet or outlet of the impeller) is greater than the loading on the rotor blade at the hub (at the outlet or inlet of the impeller).*

Broinowski does not disclose that the clearance between the tips of the rotor blades and the interior surface of the first housing section is within the range of about 0.050 inches and 0.150 inches, or is approximately 0.050 inches.

However, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to make the clearance between the tips of the rotor blades and the interior surface of the first housing section in Broinowski within the range of about 0.050 inches and 0.150 inches, or approximately 0.050 inches. Motivation to do so is found within the teachings of Aschauer, Roos and Henmi.

Aschauer teaches in column 1, lines 45-50 "efficiency of centrifugal pumps...depends on specific speed (hydraulic design), capacity (size of pump), inlet condition (inlet head), internal running clearances, surface roughness (casing and impeller material)...."

Roos teaches in column 2, lines 58 and 59 "tighter impeller clearances and better efficiency can be obtained".

Henmi et al teaches in Paragraph [0070] "gap length or spacing between each blade tip 110 and the inner surface 126 is depicted as C in FIG. 5. In the exemplary embodiment, C is about 0.35 mm. Of course, as the skilled artisan will recognize, C can be varied to be greater or less, as needed or desired."

Aschauer, Roos and Henmi et al all teach that a smaller clearance between the rotor blade tips and the interior surface of the housing for the rotor leads to more efficiency.

Henmi et al teaches a clearance much smaller the range of 0.050 inches and 0.150 inches. Henmi also teaches that the skilled artisan will recognize that the clearance can be varied to be greater or less, as needed or desired.

Art Unit: 3617

Broinowski does not disclose that the total weight of the rotor blades is about 114 pounds, that the total blade area of the rotor blades is about 854 square inches; that the internal diameter at the downstream end of the second housing section is about 8.85 inches; that the distance from a trailing end of the stator blades and a downstream end of the second housing section is in the range of about 1.29 inches, that the pressure rise in the propulsion unit is approximately 99.4 ft H<sub>2</sub>O at approximately 16 mph speed of the watercraft, and that the water flow is between approximately 95 to 105 ft<sup>3</sup>/sec at approximately 16 mph watercraft speed.

However, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to design the jet propulsion unit of Broinowski such that the total weight of the rotor blades is about 114 pounds, that the total blade area of the rotor blades is about 854 square inches that the internal diameter at the downstream end of the second housing section is about 8.85 inches; that the distance from a trailing end of the stator blades and a downstream end of the second housing section is in the range of about 1.29 inches, that the pressure rise in the propulsion unit is approximately 99.4 ft H<sub>2</sub>O at approximately 16 mph speed of the watercraft, and that the water flow is between approximately 95 to 105 ft<sup>3</sup>/sec at approximately 16 mph watercraft speed.

The weight of the rotor blade, the total blade area, the internal diameter at the downstream end of the second housing section and the distance between the trailing end of the stator blades and a downstream end of the second housing are dependent on the material used to make the rotor blades, the size of the rotor blades, the size of the

stator, the size of the second housing and the precision used in making the rotor, its blades and its housing. Thus, motivation to make the weight of the rotor blade, the total blade area and the internal diameter at the down stream end of the second housing section as claimed depend on how big and heavy one or ordinary skill in the art chooses to make the rotor, its blades and its housing. It also depends on how much one is willing to pay to machine or manufacture the rotor and its housing.

The pressure rise in the propulsion unit and the water flow in the propulsion unit again depends on the size of the unit and the amount of power provided to the unit to turn the rotor. These again are decisions made by one having ordinary skill in the art in accordance with what type of performance is desired and how much one is willing to invest to obtain a particular performance.

*Motivation to provide the claimed loading on the blade, the claimed pressure rise and the claimed water flow is found in one's desire to get a certain amount of performance from the unit at a certain cost.*

### ***Response to Arguments***

3. Applicant's arguments filed April 4, 2005 have been fully considered but they are not persuasive. The reasons applicant's arguments are not persuasive is because in Broinowski the blade loading at the hub of the inlet of the impeller is not uniform or not even with the loading of the blade tip at the blade outlet. The reasons why this is so is that the loading on the blade changes from the inlet of the impeller to the outlet of the impeller. In comparing the blade loading at the root of the blade at the inlet of the

Art Unit: 3617

impeller to the loading on the blade tip at the outlet of the propeller, Broinowski has each rotor blade shaped so as to have uneven loading from the hub (at the inlet of the propeller) to the tip (at the outlet of the propeller); Broinowski's blade has a tip wherein each rotor blade is shaped so as to have nonuniform loading as measured from the hub (at the impeller inlet) to the tip (at the outlet of the propeller) of each rotor blade; and in Broinowski, each rotor blade has a tip and is shaped so that the loading on each rotor blade at the tip (at either the inlet or outlet of the impeller) is greater than the loading on the rotor blade at the hub (at either the outlet or inlet of the impeller).

### ***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Concordia et al is cited because of the detailed discussion of blade loading on an impeller.

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of




Art Unit: 3617

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sherman D. Basinger whose telephone number is 571-272-6679. The examiner can normally be reached on Monday through Friday, 5:30 a.m. to 2:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Samuel J. Morano can be reached on 571-272-6684. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Sherman D. Basinger  
Primary Examiner  
Art Unit 3617  
5/4/05

Wednesday, May 04, 2005